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SPECIAL ARTICLES

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WHOLE CONVALESCENT BLOOD AND ANTITOXIN IN THE TREATMENT OF SCARLET FEVER

BEVERLEY HANNAH, M.B.

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The Public Health Journal

Vol. XVII. TORONTO, APRIL, 1926 No. 4

Developments of Scarlet Fever Research

By Donald M. Fraser, B.A., M.B., D.P.H.,

Assistant Professor of Hygiene and Preventive Medicine, University of Toronto

I shall review, very briefly indeed, the progress of our knowledge in regard to scarlet fever. From our present vantage point of time, it is not difficult to recognize some of the more important milestones of that progress. Sydenham, in 1661, extricated scarlet fever as a clinical entity from measles and other exanthematous diseases. More than 200 years later began the golden age of bacteriology, when the causative micro-organisms of disease were being discovered in rapid succession. Streptococci were studied by Marmorek and Schottmüller and others. As early as 1885 the presence of streptococci was demonstrated in scarlet fever patients. There was much circumstantial evidence to show that the haemolytic streptococcus was probably the causative agent. Additional corroborative evidence was brought forth by Moser and von Pirquet, who maintained that strains from scarlet fever fell into a definite group as determined by agglutination.

A few years later Gabritschewsky, director of the Bacteriological Institute of Moscow, and his associates in their clinical studies brought forward very interesting data. These workers injected a killed, broth culture vaccine of a haemolytic streptococcus isolated from a scarlet fever patient. More than 1500 persons were injected for the purpose of protecting them against the disease. In about 15 per cent. of these a rash developed within twenty-four hours. Vomiting, strawberry tongue, sore throat, and rise of temperature were also noticed; rarely a desquamation. In cases who had recovered from scarlet fever, these reactions did not occur. Vaccinated children were apparently rendered immune, but for what length of time is not determined. The etiological agent of scarlet fever is definitely stated by this group to be a haemolytic streptococcus.

Read before the Academy of Medicine, Toronto, March 2nd, 1926.

A few years previously Moser of Vienna, had introduced a therapeutic serum obtained by injecting a horse over a long period of time with broth culture of a haemolytic streptococcus obtained from a case of scarlet fever. Schick stated in 1907 that he had used this serum for years in his clinic, with beneficial results, especially in toxic cases. It must be given before the fifth day of the disease. However, it is not surprising that this serum lost its popularity when one realizes that the dose was 200 cc. and at that time, given subcutaneously.

In 1917 Schultz and Charlton described a phenomenon of great scientific moment. They found that serum from scarlet fever convalescent patients after the 14th day of the disease, when injected into the skin of a patient with a scarlet rash, that this serum blanched the rash locally. In other words, the rash was cured, so to speak, in the spot where the serum was injected. Serum from acute cases did not possess this blanching power. The exact interpretation of the Schultz-Charlton reaction, simple as it seems to us now, with our fuller knowledge, was not made by these workers. However, Mair, who worked with this reaction in 1923, states "Scarlet fever is apparently a general toxemia and the rash only a manifestation of the toxin uniting with the tissue cells . . . . The serum injected neutralizes the toxin in the tissues, and causes the disappearance of the rash. The negative reaction of the sera of acute cases of scarlet fever is simply due to the fact that antitoxin has not yet developed". This interpretation fits in with our present knowledge.

The Dicks, in 1921, attempted to produce experimental scarlet fever in humans. They failed. Two years later the experiments were repeated, with more carefully selected volunteers. They succeeded in three cases. This result was of prime importance because it removed the whole question of the causative agent from one of speculation and deduction to one of fact. In addition they discovered that a soluble toxin is produced in broth by their strains which had produced experimental scarlet fever. This toxin will cause in the skin of human beings a local reaction. With appropriate dilutions of this toxin they have developed what s known as the Dick Test, for which it is claimed that individuals who give a skin reaction are susceptible and those who do not are immune. Further, large doses in susceptible individuals will produce rash, fever, and desquamation—in a sense a non-infective, non-bacterial scarlet fever. This is quite in harmony with the results of Gabritschewsky, who had, however, not used berkefelded toxin, but a broth vaccine. This toxic filtrate, when injected into horses over a period of months will produce an antitoxin. Such antitoxin is effective therapeutically, and

will blanch the rash of scarlet fever patients just as Schultz and Charlton described by the use of convalescent serum. It has been known for years that convalescent patient serum is efficacious in the treatment of scarlet fever. Such a serum is procurable virtually only in hospital practice, and an antitoxin from other sources is desirable. Scarlet fever antitoxin serves this need.

Quite independently, Dochez has developed an effective antitoxin by immunizing horses, not with the toxin, but with a live culture of haemolytic streptococcus isolated from a scarlet fever patient.

There is an analogy between the two diseases, diphtheria and scarlet fever. The causative agent of each produces a toxin which will manifest a reaction in the skin of humans—hence the Schick Test and the Dick Test. Each of these toxins stimulates the production of a specific neutralizing antitoxin in the horse. Also each, when injected into humans, will immunize, or in other words, stimulate the production of antitoxin. (This is called active immunization, because it is our own body cells which do the manufacturing of the antitoxin. When we rely for protection upon the horse antitoxin, we speak of passive immunization).

I wish to speak for a few moments about passive immunization in scarlet fever.

First of all, will the injection of scarlet fever antitoxin immunize, or protect, against scarlet fever? From the results of others, and from our own observations, there is ample evidence that it will do so very effectively. For how long will such immunization protect? With assurance, for ten to fourteen days. In one group of carefully tested cases 68 per cent. were still immune after thirty days; in another 63 per cent. after twenty-four days. One finds much the same for passive immunization against diphtheria—safely for ten to fourteen days. Obviously, then, passive immunization is an emergency measure. It must be borne in mind that a person thus protected may become susceptible within ten to fourteen days. How soon may one be expected to be protected? One cannot speak dogmatically upon this point, but in the vast number of cases, immunity is produced within a few hours. One group showed 94% immunized within 48 hours. A smaller group 100% immunized within 48 hours. It is interesting to note that all of this latter group evidenced a degree of immunity comparable to that acquired by an attack of the disease.

When should one give scarlet fever antitoxin for prophylaxis? There is, of course, no rule that will cover all cases. One must remember that the incubation period of the disease is usually three or four days, rarely seven. Antitoxin should be given early—it will not accomplish

the impossible. The age of the patient is also an important guide. If the child is in a susceptible age group, and one thinks that it is hazardous for that child to contract scarlet fever, and if seen early in the incubation period, give the serum at once. In certain cases, particularly in older aged groups, a Dick Test and throat culture to determine the presence or absence of scarlet haemolytic streptococci may be first done. This means, of course, a loss of twenty-four hours.

The serum will produce the same reactions as will diphtheria antitoxin. One may expect serum sickness at about the tenth day or sooner, in from 20 to 60% of cases. Adults are more prone to show a local reaction in addition.

It is always gratifying to see the clinical results corroborate the laboratory findings. We know that the antitoxin is satisfactory by laboratory test. It will, apparently, do all we expect of it in clinical use. I think there is strong evidence that the incidence of scarlet fever may be diminished by specific means and that passive immunization is a safe and effective method of procuring an immunity of short duration against scarlet fever.

Results of Active Immunization using Diphtheria Toxoid*

A. M. Jeffrey

In August, 1925, the Isolation Hospital showed an increased admission of diphtheria patients. The death rate was high. As this was thought to foretell an increased incidence of diphtheria for the present Winter, steps were taken to protect the children in the two day nurseries, in which we were working.

These day nurseries are old residences in which children are fed and cared for during the day while their mothers are at work. Institutions of this kind are effective centres for the spread of communicable disease because

(1) The children are grouped together at a susceptible age. The age varies from infancy to eight, nine, or ten years.

(2) There is overcrowding.

(3) Many of the children live in boarding houses, and on going home at night come in contact with other children. Also the children of five years and over attend public schools. So that these children have ample opportunity both to contract and to spread communicable disease. The older children have no contact with the younger in the nursery.

While there are these disadvantages, these institutions are vitally necessary from the economic point of view. They enable a mother to earn her living and to support her children when otherwise she would be unable to do so. And the more one knows of how poor the home conditions of many of these children are, the more one realizes just what the nursery environment means to them.

The superintendents of the nurseries co-operated in obtaining the parents' consent in writing and we began to give the children toxoid on the first of September. Each child got two doses of ½ c.c., with an interval varying from two to four weeks between doses. Reactions, either local or general, were few and far between, and when they did occur were usually in the children over six years of age. They were never severe. They were milder in type than are caused by antitoxin.

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*Read before the Academy of Medicine on March 2nd, 1926.

In the children showing any reaction after the first dose, the second injection was withheld.

Only the children under nine were treated. No preliminary Schick test was done. However, in one of the nurseries, after all the available children of this age had been given toxoid, we did Schick tests on a dozen or so of the older children. Those showing positive tests were given toxoid. Up to date, two hundred and twenty children have been treated.

Between November 1st and February 1st, there were five children with clinical diphtheria admitted to the Isolation Hospital from these nurseries. The parents had refused to give their consent for toxoid in each of these cases. They occurred singly at intervals during these three months and no connection could be traced between them.

It is of interest to know what percentage these treated children represent of the total nursery population. This is difficult because, while many attend regularly, others come for a month or so and then leave for good. This is borne out by the fact that over twenty per cent. of those treated have already ceased to attend. This has considerably increased our difficulty in keeping an immunized majority. Recently on a day selected at random, 80% of the children under nine present for that day had had toxoid. This group under nine represents the bulk of the nursery population. The average combined daily attendance of the two institutions is about one hundred and sixty.

Observations

The first, and perhaps the most important, is that no severe reactions were encountered. Extremely few reactions of any sort at all were found in the children of six and under.

The second observation is that in the two day nurseries in which the majority of children had received toxoid, five cases of clinical diphtheria occurred singly at intervals among the untreated minority. One death occurred.

Conclusion

We feel justified in continuing this procedure in these institutions.

The Dick Test*

By L. M. Murray, B.A., M.B.
Resident Physician, Riverdale Isolation Hospital, Toronto

Introduction.—The researches of Dick and Dick, of Chicago, into the etiology of scarlet fever have resulted in their determining the etiological agent to be strains of haemolytic streptococci. This discovery has given an impetus to the study of scarlet fever, especially from the standpoint of epidemiology and immunology.

Following the isolation of the causative organism, the next logical step was to endeavour to obtain the toxin produced by the organism. Dick and Dick found that the haemolytic streptococcus, when grown under suitable conditions, produced a toxin which they isolated in a filtrate of the medium.

The use of scarlet fever toxin to determine susceptibility or immunity to scarlet fever, has resulted in the development of a skin test, which consists of the intracutaneous injection of toxin to determine the cutaneous sensibility of an individual.

In recognition of the original work of the Dick's, the skin test has been called the Dick Test. Persons who are susceptible to scarlet fever will have a positive reaction, as evidenced by a local inflammatory area at the site of injection.

Technique of the Test.—The standard dilution of the scarlet fever toxin used by Dick and Dick in the performance of the skin test was chosen to be 1/1750. This dilution was selected, following tests using dilutions of 1/500, 1/1000, 1/2000, and was found to be the most satisfactory, in giving uniform results.

The dilution of the soluble toxic filtrate, obtained from a culture of the haemolytic streptococcus of scarlet fever is injected intracutaneously on the anterior surface of the forearm, using a standard tuberculin or 1 c.c. Leur syringe with a No. 26 gauge steel needle. 1/10 c.c. was chosen as a suitable volume of the diluted toxin for intracutaneous injection.

As the toxin is completely inactivated if heated at 90°C. for 1 hour, heated toxin, in the same dilution, using the same volume, is used for the control test.

*Read before the Stated Meeting of The Academy of Medicine, Toronto, March 2nd, 1926.

Usually the injection is performed on the anterior surface of the right forearm, and the control injection on a similar area of the left forearm. If the two injections are done on the same arm, they should be made at least 7 cm. apart.

Interpretation of the reactions.—The results of the injections must be read within 24 hours. The types of reaction of the Dick test and control test are as follows:

1. Negative reaction.
2. Positive reaction.
3. Negative pseudo-reaction.
4. Positive combined reaction.

The negative reaction shows no change in the appearance of the skin at the site of either the test or the control injection.

The positive reaction begins to appear within 4-6 hours after injection, and reaches a maximum both in size and intensity in 18-36 hours. The reaction consists of a circumscribed area of redness, with slight swelling and induration, circular or oval in shape. After 24-48 hours the redness begins to fade and the swelling and induration begin to subside, so that 24 hours later there remains only an area of faint yellowish pigmentation. In a small percentage of cases some desquamation of the skin follows in about one week. Upon the size and intensity of the reaction, the positive reactors may be further classified into slightly positive, positive, and strongly positive. Slightly positive: a faint red area measuring 1-2 cm. in diameter.

Positive: A well-defined bright red area with slight swelling and tenderness, measuring from 1.5 -3 cm. in diameter.

Strongly positive: An intensely red area with definite swelling, induration and tenderness, measuring 3 cm. or more in diameter.

The negative pseudo-reaction shows an area of redness, similar in size and intensity at both the test and the control injections. It fades more rapidly than the positive reaction, but always equally at the sites of both injections. (Zingher.)

The cause of the pseudo-reaction is not clearly understood, but the suggestion has been offered that the reaction represents a local response of the tissue cells to the protein substance of the haemolytic streptococcus. The positive combined reaction, as the name suggests, is a combination of the positive and the negative pseudo-reactions, the test injection being of greater intensity than the control injection.

The Dicks and Zingher state that both the positive and the positive combined reactors are susceptible to scarlet fever, and have shown that

negative reactors, when exposed to scarlet fever, do not develop the disease.

Results of the Dick Test.—The following statements from the reports of various workers with the Dick Test indicate the results obtained by them in normal individuals, and in patients during the acute convalescent stages of scarlet fever.

1. The Dicks produced experimental scarlet fever in a person with a positive test. They found in a series of 63 persons with negative tests, none developed scarlet fever when exposed to the disease, also, they were unable to produce experimental scarlet fever in a person with a negative test.

2. Zingher tested 141 cases of scarlet fever within the first five days of onset of symptoms, and obtained 100% positive tests. Zingher also tested 170 cases of scarlet fever during convalescence, and found that 93% gave a negative reaction.

3. Graham, in Toronto, performed a series of Dick Tests on infants under one month, and found that 73% gave a similar reaction to that of the mother, 54% of which were negative reactors and 18% positive reactors. Graham also obtained the percentage of positive reactors in different age groups, showing a high percentage susceptible to scarlet fever in two age periods, namely (A) 2-4 years. (B) 10-20 years. See Table No. 1.

TABLE NO. 1

Results of Dick Test in Age Groups

Age	Cases	Dick Pos.	Dick Neg.	% Dick Pos.
0-6 mos.	105	32	73	30.5%
6-12 mos.	51	13	38	25.5%
1-2 yrs.	15	7	8	46.7%
2-3 yrs.	6	3	3	50.0%
3-4 yrs.	11	6	5	54.5%
4-5 yrs.	9	4	5	44.4%
5-10 yrs.	51	22	29	43.1%
10-15 yrs.	31	17	14	54.8%
15-20 yrs.	17	11	6	65.3%
20 yrs. up	324	100	224	30.9%

Results of Dick Tests performed at the Riverdale Isolation Hospital, Toronto

Since the introduction of the Dick Test in 1923, routine tests have been performed upon all scarlet fever patients at the Riverdale Isolation

Hospital, Toronto, both on admission and at intervals during the course of the illness. Dick tests have been performed also upon all cases of diphtheria admitted to hospital. From the result of these tests, the following statistics have been obtained.

Table No. 2 shows the rate at which the immunity to scarlet fever develops: 88% of the patients, not treated with antitoxin, became negative to the Dick test by the end of the third week.

TABLE NO. 2

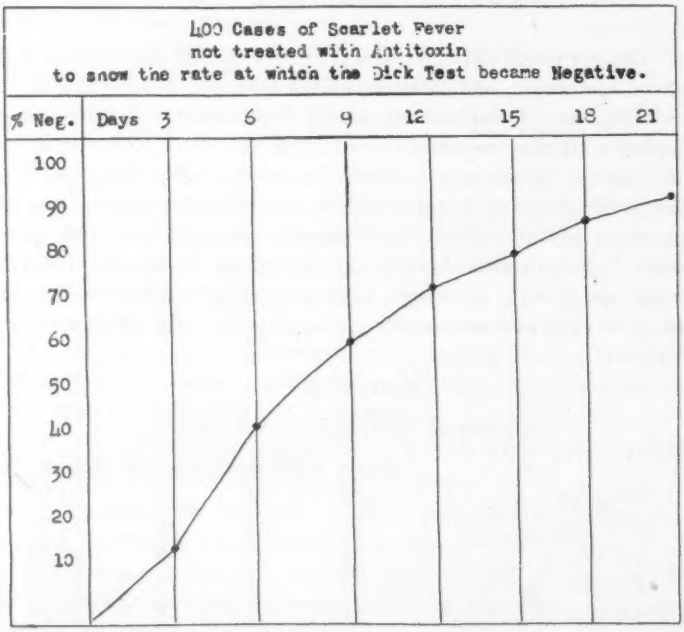

Table No. 3 indicates the percentage of negative Dick tests at weekly intervals during the course of the illness.

Table No. 4 shows that in a series of 150 cases of scarlet fever, only one gave a positive reaction to the Dick test on discharge from hospital, as shown in the third column. The first column shows 30 cases who had positive tests on admission and negative tests on discharge. In the second column are 119 cases who were negative both on admission and on discharge. The increased number in the second group may be explained by the fact that a number of patients are not admitted to

hospital until after the first few days of illness, and have developed sufficient immunity to react negatively to the Dick test.

TABLE NO. 3

Dick Tests on 400 Cases of Scarlet Fever, showing gradual development of Immunity

Day of Illness	Percent Neg.
7th day	50.7%
14th day	80.7
21st day	88
28th day	90.7
35th day	92.5
40th day	93.9
50th day	94.8
100th day	95.5
Total Number of Cases tested	400
Number becoming negative	382—95.5%
Number remaining positive	18— 4.5%

TABLE NO. 4

Results of Dick Tests on 150 Cases of Scarlet Fever

On Admission	Pos.	Neg.	Pos.
On Discharge	Neg.	Neg.	Pos.
No Antitoxin	19	78	1
Antitoxin	11	41	—
Total	30	119	1

Table No. 5. This table of 98 cases, shows the average day of illness on admission to hospital; exactly 50% of the cases were admitted on the third and fourth days of illness. The Dick tests, in this series, show that none of the cases admitted after the 6th day of illness gave a positive Dick test, and of the 78 cases which were negative on admission, 80% were admitted during the first six days of illness.

Table No. 6 gives an interesting record of Dick tests performed upon a scarlet fever patient, who was not treated with antitoxin, and who developed a relapse during the fifth week. The Dick test remained positive throughout the initial attack, showing that he had not developed sufficient immunity and was therefore, liable to a relapse or to a second

attack. The fact that the majority of patients with scarlet fever become negative to the Dick test (92.5% at the end of the 5th week) is in accord with the extreme rarity of relapse or second attacks of the disease.

TABLE NO. 5

Dick Tests on 98 Cases of Scarlet Fever not treated with Antitoxin, to show day of illness on admission and record of Test on admission

Days	No. of Cases	Pos.	Neg.
1	2	2	—
2	16	5	11
3	29	8	21
4	20	1	19
5	9	3	6
6	7	1	6
7	4	—	4
8	2	—	2
9	—	—	—
10	1	—	1
10 plus	3	—	3
No history	5	—	5
Total	98	20	78

TABLE NO. 6

Scarlet Fever with Relapse

A. K. Age—4 years.
Date of Admission, December 17th, 1925
—Day of Disease 11th
—Day of Rash 9th
December 18th—Dick Test Positive
December 21st—Acute Ethmoiditis—Right
December 22nd—Acute Ethmoiditis—Left
December 27th—Dick Test Positive
January 1st—Desquamation was general
January 6th—Relapse of Scarlet Fever
January 7th—Dick Test Positive.
January 9th—Dick Test Positive
January 16th—Dick Test Positive
February 3rd—Dick Test Negative
February 20th— Dick Test Negative

Table No. 7 is a record of the Dick tests performed upon 454 cases of Diphtheria. These patients have been divided into two groups,

(A) Those with a negative history of scarlet fever.

(B) Those with a positive history of scarlet fever.

The record shows that 82% of cases with a positive history of scarlet fever give a negative Dick test, and that 18% give a positive Dick test. The other group, those with a negative history, shows 40% positive Dick tests and 60% negative Dick tests.

TABLE NO. 7

Results of Dick Tests on Patients with Diphtheria

Total Number of Cases	454
Number with Neg. History of Scarlet Fever	393
Number with Pos. History of Scarlet Fever	61
Neg. History of Scarlet Fever	
Dick Test positive	161—40.9%
Dick Test negative	232—59.1%
Positive History of Scarlet Fever	
Dick Test positive	11—18.0%
Dick Test negative	50—82.0%

Table No. 8 contains the record of the Diphtheria patients in age groups,—and shows the percentage of positive reactors who have not had scarlet fever to diminish as the age increases.

TABLE NO. 8

Dick Tests in Cases of Diphtheria

Age Groups in 454 Cases

Age	Neg. History of Scarlet Fever				Pos. History of Scarlet Fever			
Groups	Cases	Pos.	Neg.	% Pos.	Cases	Pos.	Neg.	% Pos.
1-6 mos.	3	0	3	—	0	0	0	0
6-12 mos.	2	2	0	100%	0	0	0	0
1-2 yrs.	32	16	16	50%	0	0	0	0
2-5 yrs.	93	50	43	53.7%	9	4	5	33.3%
5-10 yrs.	142	56	86	39.8%	25	6	19	24.0%
10-15 yrs.	51	16	35	31.3%	7	0	7	—
15-20 yrs.	18	7	11	39.0%	3	0	3	—
Over 20 yrs.	52	14	38	26.9%	17	1	16	6.0%
Total	393	161	232	40.9%	61	11	50	18%

The Dick Test as an aid to diagnosis of scarlet fever.

The use of the Dick test has shown the following:

1. People who have not had scarlet fever, or who have no natural immunity, have a positive test.

2. During the early stages of scarlet fever the test is positive.

3. During the course of the illness the mapority of patients become negative to the Dick test.

These facts may be applied to the use of the Dick test in the diagnosis of doubtful cases of scarlet fever as follows:—

1. In a patient suspected of having scarlet fever, if the Dick test is positive in the early stages, from 1-6 days, and subsequently becomes negative, the diagnosis of scarlet fever is justified.

2. If during the 1st-3rd days of illness, of suspected scarlet fever, the Dick test is negative, and the clinical signs and symptoms remain indefinite, the diagnosis of scarlet fever becomes improbable.

Conclusion.—The results obtained with the Dick test at the Riverdale Isolation Hospital, Toronto, are largely in accord with the findings of the Dicks, Zingher, and other investigators. We feel that the test has justified the claim of the Dicks, and may be relied upon as a useful means of determining individual susceptibility or immunity to scarlet fever, and that, within certain limitations, it is of value as an aid to diagnosis in doubtful cases of scarlet fever.

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Whole Convalescent Blood and Antitoxin in the Treatment of Scarlet Fever*

By Beverley Hannah, M.B. (Toronto)
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The introduction of serum treatment for Scarlet Fever is not the work of any one investigator; it represents the combined efforts of numerous observers, extended over a period of years.

Progress in preventive measures and treatment for scarlet fever has been slow. Clinicians have recognized for years the toxic element in scarlet fever. The specific etiological agent in this disease has caused considerable discussion, the general view being held that some type of streptococcus was probably the causative organism.

The researches of Dick and Dick have shown that experimental scarlet fever has been produced with each of two strains of haemolytic streptococcus. This organism produces a toxin which, when injected into human subjects in a sufficient amount, will give rise to the characteristic reaction of nausea, vomiting, fever and eruption, lasting from 24 to 48 hours. The discovery of this toxin offered the laboratory a scientific basis for:

1. Development of a skin test for susceptibility and immunity.
2. The elaboration of preventive measures for active and passive immunization.
3. Production of an antitoxic serum.

Scarlet Fever is now regarded as a haemolytic streptococcal infection of the mucous membranes of the nose and throat. This germ produces a soluble toxin which is readily absorbed, and which gives rise to the characteristic rash and constitutional symptoms of this disease. This toxin stimulates an antitoxic immunity in nearly all patients. The haemolytic streptococcus tends to invade the body tissues and to produce those complications with which you are familiar.

It would appear that the immunity to scarlet fever is chiefly antitoxic and not antibacterial. Any specific treatment must be directed against the toxins, and results have shown that the symptoms most benefited by serum therapy are those attributed to the toxaemia.

Any classification of scarlet fever is purely arbitrary. Some form of grouping is necessary to formulate observations upon the value of serum treatment in this disease.

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*Read before the Stated Meeting of The Academy of Medicine, Toronto, March 2nd, 1926.

The types of scarlet fever have been classified clinically, as follows:

1. Simple.
2. Toxic.—Constitutional symptoms, especially those related to the nervous and circulatory systems, pronounced and out of proportion to the nose and throat changes where congestion and oedema are noted.
3. Septic.—Constitutional symptoms marked. Nose and throat involvement intense, with tendency to suppuration and ulceration of tissues.
4. Malignant.—It would appear more logical to restrict this latter term, "malignant", to those cases which are malignant in virtue of the intense action of the scarlet fever toxin; death ensuing within 24 to 48 hours, exposure being the chief point of aid in diagnosis.

The use of convalescent serum in the treatment of scarlet fever began with Weisbecker in 1897. The results were not encouraging. Numerous German observers in the years following, reported success with this mode of treatment. Reiss and Jungmann, in 1912, were impressed with the benefit obtained by the use of convalescent serum, when given intravenously and early in the illness. In 1915, Zingher[1] published a series of 14 cases treated by injections of whole convalescent blood, citrated and given intramuscularly. Kling and Widfelt[2] in 1917, Weaver[3] of Chicago, in 1918, Bernbaum[4] in 1922, and other investigators in various parts of the world, have reported similar good results.

The procedure followed by most workers in this form of treatment is as follows:—

The blood is drawn during the third to the fifth week of the disease, only from individuals who are free from all suspicion of tuberculosis, and who have a negative Wasserman, and who have passed through a typical attack of scarlet fever without septic complications. Blood from some patients is more effective than from others, owing to a variability in the degree of immunity developed. Absorption of the blood takes place rapidly and seldom with any local irritation.

In 1925, a series of 81 cases, treated by this method at the Riverdale Isolation Hospital, Toronto, was completed. The cases were selected from 4500 admissions to the hospital, and represent only those patients who were seriously ill with scarlet fever. (Series of charts showing results.) These results demonstrate definitely the value of whole convalescent blood in the treatment of scarlet fever, when administered early in the illness.

In hospitals, the procedure of using whole convalescent blood is easy of application, and blood is readily obtainable. If the serum treatment of scarlet fever is to have general application, antitoxin must be readily obtainable.

Treatment by Administration of Convalescent Blood. 1918-1924.

No. of patients under treatment	4516
No. of deaths	88
No. of patients given Convalescent Blood	81
(*a*) Cases recovered	67
(*b*) Cases died	14

Result of Treatment according to Clinical Type of Case

	Cured	Died
Simple	21	0
Toxic	33	6
Septic	13	8
Malignant	0	0
Total	67	14

	0-1 yr.	2-5 yrs.	6-10 yrs.	11-20 yrs.	21-40 yrs.
Age Incidence of series	2	24	25	20	10

Average Volume of Whole Convalescent Blood administered intramuscularly, majority of cases in one dose—80 cc.

Average day of disease when treatment was given—3rd-4th.

The recent contribution to medical science of a serum for prophylaxis and treatment in scarlet fever, marks a new era in the history of this disease.

As far back as 1895, Marmorek[5] introduced an antistreptococcal serum obtained by immunizing horses with living streptococci, for use in all streptococcal infections. Many sera were placed on the market from time to time, some of them being intended for use in scarlet fever. In 1902, Moser[6] obtained a serum by immunizing horses with living cultures of haemolytic streptococci cultured from the heart's blood of fatal cases of scarlet fever. Similarly, in 1905, Savchenko[7] employed a scarlatinal antitoxic serum. Although these sera had apparently a beneficial effect upon the disease, they were abandoned, on account of the large dosage required and the severe reactions following upon their usage.

The identification of the causative organism and the production of experimental scarlet fever in human subjects by Dick and Dick[8] of Chicago, in 1923-24, and confirmed by Dochez and Stevens, Bliss, Gordon, Williams and Tunicliff, turned the attention of these investigators to the possibility of a scarlet fever antitoxin serum.

Dochez,[9] in January, 1924, and Dick and Dick,[10] in April, 1924, introduced their antitoxic serum for the treatment of this disease. The methods used by these investigators for preparing the antitoxin are different. The antisera produced by these two methods both have the property of neutralizing the toxin from the strains used by the Dicks in the production of experimental scarlet fever. Further observations will be necessary before it is determined whether or not the antibacterial element has any influence upon the clinical course of this disease. There may be other clinically useful antibodies contained in these sera which are at present unmeasurable and which may modify the septic complications of scarlet fever.

The result of investigations led the Hygienic Laboratory, U.S. Public Health Service, to adopt the recommendation that a unit be defined as that amount of antitoxin which will exactly neutralize 100 skin-test doses of toxin. The laboratories are endeavouring to bring antitoxin to a standard potency, upon this basis. Clinical experience shows that for the present, the dosage may be stated in cubic centimetres. 30-60 c.cs. for adults, 15-30 c.cs. for children is the initial dosage, repeated within twenty-four hours, if required.

The methods of administration are two:—

1. Intravenously.
2. Intramuscularly.

Two important facts should always be borne in mind when giving antitoxin for treatment:—

1. A large initial dosage.
2. Adoption of the route giving the most rapid absorption without any danger to the patient, *i.e.* intramuscular.

Intravenous administration is undoubtedly the ideal method, but is not without its dangers. Scarlet fever antitoxin should always be given intramuscularly, the site of injection being the lateral or anterior aspect of the thigh.

Toxin formation and absorption into the blood are at their height during the first week of the disease, according to Blake. He also suggested that the body tissues begin to form their own antibodies about the fourth day. Antitoxin to be beneficial, must be administered during this early period and before the rash fades. The changes which take place

are usually of a striking character. The temperature drops, reaching normal within 24 to 36 hours. The pulse becomes stronger, steadier and slower. The rash fades rapidly and any cyanosis disappears. Drowsiness, legthargy and stupor are replaced within 24 hours by a feeling of "well-being". The restless, often delirious mental state is transformed into one of quietness and natural sleep. These clinical changes are well demonstrated in the simple and toxic types. The septic type is frequently accompanied by an initial fall in temperature and general improvement in the patient's condition. It would appear that the tendency for septic complications to occur is diminished, and the patient in a better condition to combat any which may develop.

Scarlet Fever antitoxin has been used in the treatment of this disease at the Riverdale Isolation Hospital, Toronto, for the last six months. Clinical observations have been made on a series of 200 cases. The routine treatment followed in the hospital, is:—

1. All cases which are acutely ill receive antitoxin.

2. All cases not acutely ill, and with a temperature below 101°, are treated as follows,—

(*a*) Clinical signs and symptoms definite; antitoxin is given.

(*b*) Clinical signs and symptoms mild or indefinite; antitoxin is not administered, but a Dick test is performed for diagnostic purposes.

Most of the cases included in this series are of the simple or toxic types and demonstrate the clinical changes above mentioned. (Series of charts illustrating results.) Severe toxic and septic cases have been very few in number during the past six months.

A review of the Scarlet Fever statistics on case incidence and mortality rate during the past ten years, shows that this disease is just as prevalent to-day, and that the mortality has remained not only stationary, but extremely low. The more frequent complications noted in over 2000 cases under treatment prior to the use of antitoxin, are shown in the following table.

COMPLICATIONS IN SCARLET FEVER

RIVERDALE ISOLATION HOSPITAL, TORONTO

May, 1922—May, 1925

PRIOR TO TREATMENT WITH ANTITOXIN

Number of cases admitted to hospital	2005
Number of cases developing complications	793
Per cent. of cases developing complications	39.5%

Relative Frequency of the More Common Complications

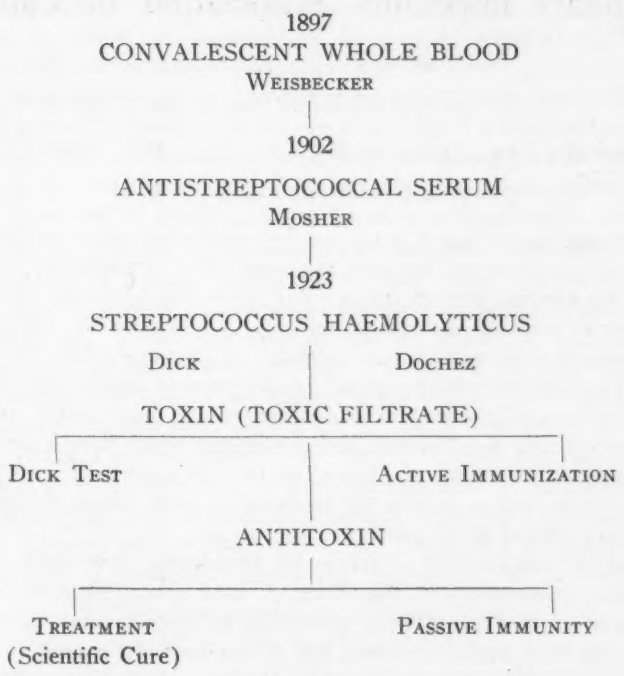
Complication	Cases	Per cent. of Total Cases
Adenitis, Cervical—Simple	293	14.8
Suppurative	32	1.5
Otitis Media	283	14.1
Arthritis, Simple	158	7.8
Mastoiditis	56	2.7
Carditis, Acute	27	1.3
Nephritis, Acute	22	1.09
Sinusitis, Acute—Maxillary	19	.94
Ethmoid	6	.3
Frontal	2	.09
Abscess—Peritonsillar	18	.89
Retropharyngeal	1	.05

Statistics, relating to the mortality rate and the incidence of complications in scarlet fever, obtained with the use of antitoxin, cannot be presented until observations have been made on a large series of cases.

Serum reactions, consisting of fever 99°—101°, rash and joint changes, occurred in about 49% of the cases. Any immediate ill-effects of an anaphylactic nature, from the antitoxin, have not been noted in this series.

Credit must be given to the early workers, especially Moser and Savchenko, for introducing a serum, prepared by laboratory methods, for the treatment of scarlet fever. It remained for the Dicks, Dochez, and other more recent workers to carry on further investigations, and bring immunization and treatment of scarlet fever to its present status.

THE EVOLUTION OF SCARLET FEVER



A scarlet fever antitoxin has been prepared possessing curative properties through its power to neutralize the toxins poured into the blood stream. This factor alone justifies its administration in the treatment of scarlet fever.

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Sanitary Inspectors' Association of Canada

PRESIDENT'S ADDRESS

To the Sanitary Inspectors' Association, England

By Sir William J. Collins, K.C.V.O .,M.D., M.S., B.Sc., F.R.C.S.

Reprinted from *The Sanitary Journal*

For the fourth time it is my privilege and pleasure to address this Annual Conference of Sanitary Inspectors in a Presidential capacity. Since we met last year at Whitley Bay much has happened of special interest to practical sanitarians, not only in regard to the examination tests and the training of future entrants to your profession, but also in regard to legislative changes promised, proposed or carried, affecting the health of the public, whose custodians you are, and indeed in the yet wider field of scientific developments and attainments which have a proximate bearing upon the causes of disease or the philosophy of health, and which cannot fail to engross the attention of those whose thought and action are enlisted in the public service.

Humbly endeavouring to follow the presidential precedents of my illustrious predecessors in this chair, I have conceived it to be the aspiration of these conferential gatherings not only to exalt the calling which you have made your own, but to transcend the narrow limits of merely professional interest, to keep abreast of the great movements stirring in those sciences which afford the basic principles of your craft, to press all relevant knowledge into the service of your vocation and claim that although inspectors you are yet human and that to you nothing human, humane, or in its nobler sense humanitarian, comes amiss.

Let us glance at some of these wider questions to which recent events and discussions have directed or recalled the attention of the public. The centenary of Huxley's birth on May 4 and the recent state trial of a school teacher in Tennessee have given fresh zest to the theory of evolution and resuscitated some of the earlier conflicts between science and religion, often conducted in ways neither scientific nor religious, which greeted the appearance of that doctrine and the recognition of its implications. It is not easy for us to appreciate the fervour with which "fundamentalism", as it is called, is advocated in the United States; the inconsistency between the Mosaic cosmogony, literally interpreted, and the origin of species of animals as well as of man himself,

has ceased to excite bitter partisan controversy in Western Europe. It is true that under a State system of education the question of what teaching should, or should not, be subsidized by moneys derived from the compulsory levy of rates and taxes has been in recent years a serious political problem here; and the distinction between the State-paid teaching of a scientific doctrine on the one hand, and of a religious dogma on the other, may not be capable of precise discrimination. We are thus brought face to face with the fundamental claims of democracy in government and of liberty of thought and its expression.

Prior to 1860 the evolutionary views associated with the names of Darwin, Alfred Russell Wallace and Herbert Spencer would have been regarded as heresy by the leaders of science. As Lord Oxford recently reminded us: "Science like theology was apt, unless it was carefully looked after, to lapse into dogmatism; and one of the most interesting and instructive lessons in that chapter in the annals of free thought was the warning it gave them against the too facile assumption of finality. . . . . It was perhaps, lucky that men of science had not at their disposal, as churchmen used to have, the apparatus of excommunication and inquisition", and he cited the treatment meted out to Samuel Butler —the perverse and brilliant author of *Erewhon*—"by some of the hierophants of Evolution". Scientists, like divines, have to learn:—

"There lives more faith in honest doubt,
Believe me, than in half the creeds."

One recalls the bitter strife which Huxley waged with Wilberforce and Gladstone over the Bible and science when his opponents had not the light-handed gaiety to retort, as Kingsley did, "Oh ye men of science leave us our ancestors in Paradise and you may have yours in the Zoological Gardens."

As showing alike the modernity of the doctrine of evolution and the mutability of scientific authority one may refer to the interesting chapter contributed by Huxley himself, to the 2nd volume of the *Life and Letters of Charles Darwin* in 1887, in which he says, "There is not the slightest doubt that if a general council of the church scientific had been held in 1860, we (that is the evolutionists) should have been condemned by an overwhelming majority, and there is as little doubt, if such a council gathered now the decree would be of an exactly contrary nature". Huxley then inquires: "What are the causes which led instructed and fair-judging men of that day to arrive at a judgment so different from that which seems just and fair to those who follow them?" "That", he says, "is really one of the most interesting of all questions connected

with the history of science". He then relates with candour the story of his own conversion. As a militant opponent of the transmutation of species in the 'fifties of last century he slashed with a "needless savagery", which he afterwards regretted, the eloquent author of *The Vestiges of the Natural History of Creation* in much the same way as Sir Charles Lyell had slashed Lamarck. He turned a deaf ear to Dr. Grant, of University College, and he even defied Herbert Spencer's dialectic skill on behalf of evolution. Thus he continued until "Darwin and Wallace dispelled the darkness", and he said to himself: "How extremely stupid not to have thought of that!" And then he adds: "The result has been that complete *volte face* of the whole scientific world which must seem so surprising to the present generation".

Consistency seemed to require that the same principle of orderly evolution in the animal and vegetable kingdoms should obtain throughout the inorganic world also, and even the "immutable" elements, in the light of the periodic law of Newlands and Mendeljeff, appeared to be linked in a sequence of an evolutionary nature. So fantastic did such notion appear when first submitted by Newlands to the Royal Society that scientific authority rejected his arrangement of the elements in periodic octaves and scornfully suggested that he might as well set them out in alphabetical order.

Nevertheless, the accumulating evidence of the orderly and continuous and continuing and continual development of the universe which has disclosed itself to the scrutiny of science, whether in obedience to a law of evolution, a *causa causans* or a divine will has entirely altered the point of view from which we contemplate the phenomena of nature. Science in disclosing the methods whereby the phenomena with which it deals have developed, and in synthesizing into generalizations—perhaps unfortunately called "laws"—the *modus operandi* of their interactions has only served in explaining the *how* to leave untouched the *why*, the *whence* and the *whither*, and indeed it was metaphysical speculations rather than material interests and activities that engaged the later cogitations of Herbert Spencer. So also Alfred Russell Wallace in his subsequent work on *Darwinism* gave his reasons for regarding "the spiritual nature of man as not in any way inconsistent with the theory of evolution, but as dependent on those fundamental laws and causes which furnish the very materials for evolution to work upon".

(*To be continued in next issue*)

Radio Talk on Physiology

By Professor J. J. R. MacLeod

Radio talk arranged by the Canadian Social Hygiene Council and delivered from CKCL, Toronto

Hygiene is the science of the preservation of health, and it has, in general, two aspects. One of these has to do with the establishment of suitable conditions for man to live in—pure air, proper food and clean water. The other concerns the conduct of living by the individual himself. The former of these can be controlled by the organized effort of the community as a whole and for this purpose every civilized country has departments of health which perform their functions by preventing less contamination by disease-producing agencies of the air we breathe and the food and water we live on. For this purpose these departments are assisted by laws which enable them to isolate infected individuals in hospitals or by quarantine, and to control the food and water supplies so as to keep them free from carrying disease-producing organisms or other materials harmful to health. But this general regulation of the conditions of living cannot preserve the health without co-operation on the part of the individual himself. Besides public hygiene there must also be personal hygiene. The body must be kept in a normal working order so that its natural defence against disease may be ever in a state preparedness to combat those infections which cannot be controlled by the public authority. For example, the individual must choose his food so that it may contain all the elements necessary for the proper nutrition of his body, he must regulate the proportion between muscular rest and activity so that his body may be kept fit, and he must keep away from contact with sources of infection of diseases which are transmitted only by actual contact between himself and other individuals. No one of any intelligence can for a moment doubt that the remarkable improvement in the general health of the community, the remarkable lengthening of the average span of life, and the greatly increased general prosperity are the outcome of public health administration, but as yet a beginning only has been made in having the principles of general hygiene applied. This is a much more difficult problem. It cannot be done by legislation, for to attempt to do so robs the individual of his much cherished personal liberty. There is only one method of approach, which is by education, and there is probably no problem having to do with the general welfare

that is more difficult of solution than to devise means by which this education in matters of personal hygiene can be brought about. It is the function of the committee, under whose auspices I am speaking to-night, to devise means by which this education in health matters may best be brought about. There is no use laying down laws of health, for laws will not be obeyed unless their motives be understood and the consequences of their non-fulfilment fully appreciated. A person who continually takes improper food at irregular hours and in a frenzied hurry, is apt sooner or later to become a miserable dyspeptic with thin blood and weakened tissues and irritable temper—a ready victim for the first infection which may come his way. He cannot realize the danger he is incurring unless he know something, not much perhaps, of what food should be composed of and of how it is digested and assimilated. Or let us take another example, muscular exercise. How can one know what amount of this is beneficial to his own well being? The answer can only be supplied when something—again not much—is known of the manner by which the circulation of the blood and the breathing adapt themselves to muscular effort. That the individual himself may be able to control these matters of personal hygiene it is essential that he know something of the normal working of the human body. Elementary physiology should be taught in every school, not perhaps as a class subject, for there are already too many of these, but in association with athletics and physical culture and household science. If this were properly done there can be no doubt that much suffering due to mistakes in the regulation of the bodily functions, through ignorance, could be avoided.

There is one branch of personal hygiene that is particularly difficult to deal with. This is known as social hygiene. It has to do with problems of reproduction and the relationship of the sex to each other, and it is rapidly coming to be regarded by all those who are interested in the welfare and happiness of mankind as one requiring more careful study and supervision. The inherent difficulties which stand in the way of having children, as they grow and develop into manhood and womanhood, made aware of the great dangers to their future happiness which surround them, are obvious to everyone. Legislation cannot go far, for these are problems which each individual must work out for himself. However accurately we may be able to trace the causes and realize the sources of danger of the social diseases, we cannot legislate against them, all we can do is to offer help to the devolping child to enable him or her to understand the significance of sex. This instruction must obviously come in the first place from the parents; it must be adapted to the temperament and the susceptibilities of each child, it must be straight-

forward, simple and accurate, and at the same time of such a nature as not to offend or destroy sentiment. The Division of Education of the Canadian Social Hygiene Council has the problem in hand of finding out how it may assist in this instruction. How can it help the parent to guide the child to a realization of the dangers that be in its path towards manhood and womanhood? There is no simple answer to this question, but I am certain that very much could be done in the schools by adding to the simple instruction in physiology and hygiene, to which I have already referred, lessons on the fundamental principles of reproduction of living things. Lessons on fertilization and reproduction in plants and lowly animals, encouragement to read books dealing with natural history and nature studies, instructional visits to museums and zoological gardens; all these prepare the youthful mind so that when the proper time comes it may comprehend and understand the relationship of the sexes.

National Nursing Organizations Hold Biennial Convention

May 17 to 22, Atlantic City

More than 5,000 women representing every department of the nursing profession in America will gather at Atlantic City, May 17 to 22, for the biennial convention of the national nursing organizations. Nurses from every state in the union, and from Porto Rico, Hawaii and Canada, will be present at the convention, which will be the largest gathering of professional women ever held in the United States. An aggregate membership of 60,000 is represented in the three participating organizations, the American Nurses' Association, the National League of Nursing Education, and the National Organization for Public Health Nursing.

In addition to nurses from the private duty field, there will be in attendance nurses holding administrative and executive positions in hospitals and other institutions, faculty members of nursing schools, public health nurses, industrial nurses, members of the medical profession, social service workers, and anaesthetists.

With thirteen other health associations, the nursing organizations will participate in the American Health Congress which will meet at Atlantic City the same week. Speakers of international and national reputation on the programme will include Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P., well known in public health work in England, Dr. C. E. A. Winslow, president of the American Public Health Association, Dr. Ray Lyman Wilbur, president of Leland Stanford University, and Dr. George E. Vincent, president of the Rockefeller Foundation.

Joint meetings of the three organizations will be held for the consideration of general questions pertaining to the profession and separate sessions for the discussion of nursing specialties. Features at the American Nurses' Association convention will be the meetings of the Private Duty, the Mental Hygiene, the Legislative and the Government Nursing Service sections. "Milestones in Nursing", "The Nursing of People Who Are Mentally Ill", and "Legislation and the Profession" will be some of the high lights on the programme.

The forecast of the programme of the National Organization for Public Health Nursing includes a special session with the nursing section

of the American Public Health Association, at which "The Graphic Presentation of Public Health Nursing" will be discussed. Among the speakers scheduled are Mary Ayres Burgess, Ph.D., statistician for the Committee on Dispensary Development, who during the war was associated with Col. Leonard Ayres, her brother, director of the Division of Statistics of the War Industries Board, Miss Mary Dempsey, statistician of the Milbank Demonstration at Syracuse, N.Y., and Miss Louise Tattershall, statistician for the National Organization for Public Health Nursing. One of the biggest features of the convention will be a special session arranged by laymen, at which "The Fundamentals of Public Health Nursing Organization", and "The Relationship Between National and Local Organizations" will be discussed.

Other subjects which will receive special emphasis at the meetings of the National Organization for Public Health Nursing are, "The Normal Pre-School Child", "What Industry Expects of the Nurses", "What the Nurse Can Give to Industry", and "Trends in Public Health Nursing Education".

At the convention of the National League of Nursing Education the relation of education to nursing progress will be the theme of the sessions. Prominent educators will appear on the programme.

Those in charge of the convention state that Miss Linda Richards, now living at Roxbury, Mass., was the first trained nurse in the United States. She graduated in 1873 from the New England Hospital for Women and Children at Boston, and took a prominent part in organizing the first nursing schools in America and Japan. She was the first night superintendent at Bellevue Hospital Training School, organized the Massachusetts General Hospital Training School at Boston, the Boston City Hospital School for Nurses, and the first school of nursing for Japanese nurses at Kyoto, Japan. Miss Richards was also influential in establishing schools of nursing in state hospitals for the insane. It is hoped that she will be able to attend the convention.

It is officially stated that there are now about 200,000 nurses in the United States, and approximately 13,000 nurses are graduated annually from the 1,700 nursing schools of the country. Among the outstanding accomplishments of American nurses are legislative work in 48 states, which now have laws on registration which protect the public against those incompetent to care for the sick, the establishment of community nursing in the United States, and the raising of $300,000 for educational and other purposes, including $119,000 for the Nurses' Relief Fund, which is maintained for nurses in financial need.

The Provincial Board of Health of Ontario

Communicable Diseases reported for the Province for the Weeks ending March 6th, 13th, 20th, 27th, 1926

COMPARATIVE TABLE

Diseases	1926 Cases	1926 Deaths	1925 Cases	1925 Deaths
Cerebro Spinal Meningitis	—	7	—	3
Chancroid	—	—	2	—
Chicken Pox	640	—	398	—
Diphtheria	155	9	265	15
Encephalitis	1	1	7	4
Gonorrhoea	132	—	110	—
Influenza	—	44	—	56
German Measles	943	—	27	—
Measles	2661	5	1663	7
Mumps	415	—	1281	—
Poliomyelitis	—	—	1	1
Pneumonia	—	237	—	230
Scarlet Fever	632	12	681	8
Septic Sore Throat				
Small Pox	45	1	16	—
Syphilis	103	—	101	—
Tuberculosis	144	88	159	80
Typhoid	33	1	72	8
Whooping Cough	310	7	464	13

The following Municipalities reported cases of Small Pox: Toronto 1; Kitchener 14, 1 death; Percy Tp. Wilmot Tp. 3; Marmora Tp. 1; Marmora Village 1; Belleville 1; Sidney Tp. 1; Kingston 1; Guelph 2; King Tp. 12; Eganville 1; Brantford 1; Sarnia 3; Blind River 1; Sudbury 1.

JOHN W. S. MCCULLOUGH.

News Notes

British Columbia

The third annual meeting of the Public Health Nurses of British Columbia will be held at the University of British Columbia on the 7th, 8th and 9th of April. The Nurses are brought together by the Department for a Conference, and the two previous Courses have been remarkably successful from the Nurses' point of view. The discussion of their local difficulties and the interchange of ideas is, they say, not only very stimulating, but very instructive. Speakers from the outside are provided, but the part which the Nurses say they appreciate more than the others is the round table conferences, when they appoint their own chairman and assume entire management of the meeting.

In 1919 the Superintendent of the Mental Hospital, answering an enquiry, said that on a conservative basis that 10% of the patients in the Institution were there as a result of Syphilis. This year in his Annual Report, he says that Syphilis is the cause of 2%, and attributes the fall to the work being carried on by the Provincial Venereal Clinics. If the estimate is right, then we are reaching a result which I think we did not anticipate any particular change for ten years from the beginning of the treatments.

Smallpox of a malignant type has been prevalent in Los Angeles, Cal., and has developed since the first of January in Seattle, Wash. Mortality is about 30%. It would appear that the peak has been passed, and very active measures were taken furthering a vaccination campaign at both points. At Los Angeles, they claim to have vaccinated 500,000 in the city and surrounding municipalities. In Seattle, there were 85 cases since the first of January, with 21 deaths, every adult with malignant type has died, not one having been successfully vaccinated. Fortunately we are free of it as yet in British Columbia.

Dr. Pagé, of the Federal Department of Health, has been with us for the past few days, in re-arranging our quarantine service. A full-time trained man is being put in charge in Vancouver City. The Provincial Board of Health and the Municipal Authorities of the City of Vancouver, in co-operation with the Harbour Commission, some two months ago instituted proceedings to provide full facilities by the establishment

of a special laboratory to handle all suspicious cases at the Docks, and the institution of a rat catching brigade. We have not had any Plague for a number of years, but the Port is becoming more and more important and in order to conform with the international agreements we are providing the above facilities. This will result in Vancouver being classed as a first-class port from the health point of view.

ALBERTA

The Child Welfare Association of Calgary, of which Mrs. Harold Riley is Secretary, is putting on a Child Welfare week, beginning April 5th.

The branch of Communicable Diseases, under the direction of Dr. R. B. Jenkins, has immunized nine hundred and fifty-four children against diphtheria, and vaccinated one thousand three hundred and eighty-two children against smallpox in the rural districts populated by people of foreign birth. The Health Inspector, who speaks the language of these people, addressed many public meetings. The interest of the people is shown by the fact that they crowded the halls, and it was not uncommon for our Inspector to speak from eight o'clock until twelve.

A Board of Visitors was appointed by the Minister to inspect all institutions operated by the Department of Public Health and have recently submitted a report to the Legislature. The report spoke in very complimentary terms of the administration of these institutions.

A young girl, thirteen years of age, was admitted to the Ponoka Mental Hospital with clinical and serological symptoms of General Paralysis of the Insane, and is now undergoing malarial treatment.

Municipal Hospitals: The result of the year's operation of Municipal Hospitals shows a comfortable surplus in each hospital district. In some cases the Hospital Boards have been able to buy in their outstanding debentures.

An unfortunate accident occurred in one of the hospitals in Alberta, an explosion of ether due to a static spark. The patient was somewhat burned, but fortunately has recovered completely.

The Provincial Government has appointed Dr. E. A. Braithwaite as Chief Coroner and Inspector of Hospitals. All sudden deaths following operations will be investigated by the Chief Coroner.

NEW BRUNSWICK

On January 1st, J. A. Wade, Esq., B.A., M.D., severed his connection with the Department of Health of New Brunswick, as District Medical Health Officer, because of physical disability induced by age. Dr. O. E. Morehouse, of the county of York, has succeeded him as District Medical Health Officer for the Western Health District of New Brunswick.

In consequence of the resignation of Dr. Honore Cyr, as Medical Inspector of Schools for the counties of Gloucester, Madawaska and Restigouche (Area 1), Dr. J. S. P. Richard, of Gloucester county, has been appointed to that position.

QUEBEC

During the last week in February, the annual conference of the District Health Inspectors of the Province of Quebec was held at the Provincial Bureau of Health, when matters pertaining to their work were discussed.

Two important papers were read:—One by Dr. E. M. A. Savard, Chief Inspector of the Department, on the "Ice Supply", and one by Dr. A. Bernier, bacteriologist and chief of laboratories, on "Communicable Disease Prevention".

The former showed the danger of natural ice when harvested in suspicious bodies of water, and emphasized the necessity of exercising a proper control on the ice stored. Dr. Bernier's paper discussed at some length the principal preventive measures (vaccines and sera) against Scarlet Fever, Measles and Diphtheria.

The technique of Dick's reaction and Dochez and Dick's anti-scarlet fever serum, the serum of convalescents in the immunization against measles, and Ramon's anatoxin against diphtheria was explained at some length.

Book Reviews

Ears and The Man, by Annetta W. Peck, Estelle E. Samuelson, Ann Lehman. Published by F. A. Davis Company, Philadelphia. Price $2.00 net.

A very good story of the difficulties and triumphs of those who are "hard of hearing". It contains some two hundred pages dealing with the various classes of deaf people, the psychological effects of adventitious deafness, lip-reading as a life-saver, methods of lip-reading, teachers of lip-reading, the advantages and disadvantages of mechanical hearing aids and the various ways ears are necessary to work and play.

This excellent book is full of true illustrations of those who have been helped through the various methods of re-habilitation, and of those who for various reasons would not be benefited.

Human Physiology, For High Schools and Colleges, by Percy Goldthwait Stiles, Assistant Professor of Physiology in Harvard University. 435 pages, illustrated, Fourth Edition. $2.25. W. B. Saunders Company, London & Philadelphia. McAinsh & Co. Limited, Toronto.

An ideal exposition of the subject of Physiology. The work consists of 30 chapters dealing with the various tissues and organic systems, metabolism, requisites of diet, internal secretions, reproduction, etc. The language is simple and the book should be of immense value to both students and teachers of this subject.

PRELIMINARY PROGRAMME

NATIONAL PUBLIC HEALTH CONVENTION

CANADIAN PUBLIC HEALTH ASSOCIATION
15th ANNUAL MEETING

PRESIDENT
DR. GEORGE D. PORTER
Toronto, Ont.

SECRETARY
DR. J. T. PHAIR
Toronto, Ont.

ONTARIO HEALTH OFFICERS' ASSOCIATION
12th ANNUAL MEETING

PRESIDENT
DR. FRED. ADAMS
Windsor, Ont.

ACTING SECRETARY
DR. J. T. PHAIR
Toronto, Ont.

CANADIAN SOCIAL HYGIENE COUNCIL
6th ANNUAL MEETING

PRESIDENT
HON. MR. JUSTICE RIDDELL,
Toronto, Ont.

SECRETARY
DR. GORDON BATES
Toronto, Ont.

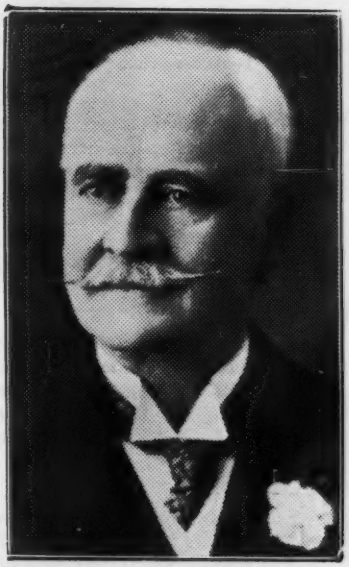
UNIVERSITY OF TORONTO
PHYSICS BUILDING
TORONTO, MAY 5, 6, 7, 1926

Clinics, Demonstrations, etc., May 3, 4 and 8, 1926

HON. DR. FORBES GODFREY

Minister of Health, Ontario
Hon. President Canadian Public Health Association
Hon. President Ontario Health Officers' Association
Hon. Advisory Director Canadian Social Hygiene Council

DR. GEORGE D. PORTER
President Canadian Public Health Association



HON. MR. JUSTICE RIDDELL
President Canadian Social Hygiene Council

DR. FRED ADAMS
President Ontario Health Officers' Association

Directory of Sessions

All sessions will be held in the Physics Building, University of Toronto, unless otherwise stated

Time—Daylight Saving.

Registration Desk will be open on Monday, May 3rd, Tuesday, May 4th, and Saturday, May 8th, for those wishing to take advantage of the Clinics, Demonstrations and Visits.

Wednesday, May 5th:

9.00 a.m.—Registration, Physics Building, University of Toronto.
9.30 a.m.—Laboratory Section, Room 18.
9.30 a.m.—Joint meeting of Public Health Nursing and Child Hygiene Sections, Room 43.
2.15 p.m.—General meeting of the Associations, Room 43.
7.00 p.m.—Dinner, Hart House, University of Toronto.

Thursday, May 6th:

9.00 a.m.—Ontario Health Officers' Association, Room 43.
2.15 p.m.—General meeting of the Associations, Room 43.
8.30 p.m.—Joint meeting with the Academy of Medicine, Toronto, Academy of Medicine, 13 Queen's Park.
8.00 p.m.—Public Health Nursing Section, Room 43.

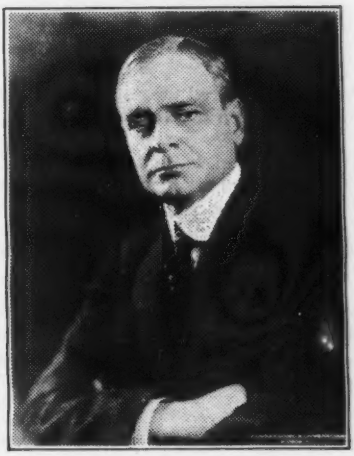
Friday, May 7th:

9.00 a.m.—Ontario Health Officers' Association, Room 43.
9.30 a.m.—Laboratory Section, Room 18.
2.15 p.m.—General meeting of the Associations, Room 43.
5.00 p.m.—Canadian Public Health Association, Annual Meeting.
8.15 p.m.—Canadian Social Hygiene Council, Annual Meeting, Hygeia House, 40 Elm Street.

Clinics, Demonstrations, and Visits arranged by Department of Health, Ontario, Department of Public Health, Toronto, Connaught Laboratories, University of Toronto, Hospital for Sick Children, and I.O.D.E. Preventorium.
Monday, May 3rd, 2.00 p.m.
Tuesday, May 4th, 9.00 a.m.
2.00 p.m.
Saturday, May 8th, 9.00 a.m.

*Register at Information Desk, Physics Building, for these clinics and visits.

Guests of the Convention



DR. GEORGE E. VINCENT
President, of the Rockefeller Foundation

PROF. C.-E. A. WINSLOW
Professor of Public Health, Yale University
President American Public Health Association

PROF. HAVEN EMERSON
Professor of Public Health Administration
Columbia University

Field Work

The committee in charge have made every effort to supply during the Convention week a full programme covering all health activities. Prominent speakers will be present from all parts of Canada and from the United States, and it is hoped that all members of co-operating organizations will take the opportunity of being present during as much of the week as possible.

In addition to the opportunities presented by the general programme the committee has arranged for certain field work so that those engaged in public health work may see or take part in public health activities being carried on in Toronto. Members desiring to participate in this part of the programme will find that Monday, Tuesday and Saturday morning of the convention week have been reserved for their convenience.

Details of field work available will be found on the last page of this programme. If members desire further field work in connection with health activities not dealt with by the present arrangements, a communication to Dr. J. T. Phair, Convention Secretary, will receive prompt attention.

Field work now included in the programme has been made possible through the courtesy of Department of Health, Ontario, Department of Public Health, Toronto, Connaught Laboratories, University of Toronto, Hospital for Sick Children and I.O.D.E. Preventorium.

Programme

Registration—Wednesday, May 5th, 9.00 a.m.—Physics Building, University of Toronto

FIRST SESSION

Laboratory Section

Wednesday, May 5th, 9.30 a.m.—Room 18.

Chairman—Dr. Norman MacLeod Harris, Department of Health, Canada.

"The Influence of B. Welchii Toxin on Red Blood Cells in Vivo and in Vitro"—Dr. Guilford H. Reed and Dr. J. H. Orr, Queen's University, Kingston, Ont.

"Transfer of Infection by Handshaking"—Dr. Hibbert W. Hill, University of British Columbia, Vancouver, B.C.

"A Survey of the Results of Routine and Other Wassermann Tests in the Toronto General Hospital for the Past Few Years"—Dr. Herbert K. Detweiler, Toronto General Hospital, Toronto.

"Carbon Monoxide Poisoning"—Dr. I. H. Erb, Hospital for Sick Children, Toronto.

Joint Meeting

Public Health Nursing and Child Hygiene Sections

Wednesday, May 5th, 9.30 a.m.—Room 41.

Chairman—Dr. W. J. Bell, Deputy Minister of Health, Ontario.

"CONTRIBUTING FACTORS IN CHILD HEALTH"—

"An Analysis of Neo-natal Mortality"—Dr. Helen MacMurchy, Chief Division of Child Welfare, Department of Health, Canada.

"Diet and Hygiene of Pregnancy from the Nurse's Standpoint"—Elizabeth L. Smellie, Reg. N., Chief Superintendent, Victorian Order of Nurses for Canada, Ottawa.

"The Prevention of Infections in Early Infancy"—Dr. George Smith, Consulting Physician, Hospital for Sick Children, Toronto.

Discussion in relation to—

"The Urban Community"—Dr. McCaig, Medical Officer of Health, Sault Ste. Marie. Jessie Woods, Reg. N., Supervisor, Pre-natal, Infant and Pre-School Hygiene Nursing, Department of Public Health, Toronto.

"The Rural Community and the Nursing Outpost"—Maud E. Wilkinson, Reg. N., Director, Nursing Service, Ontario Division, Canadian Red Cross Society, Toronto.

"INFECTIONS OF THE NASO-PHARYNX"—Dr. Edmund Boyd, Hospital for Sick Children, Toronto.

Election of Officers, Section of Child Hygiene.

SECOND SESSION

General Meeting of the Associations

Wednesday, May 5th, 2.15 p.m.—Room 43.

Address of Welcome—His Worship Mayor Foster.

Presidential Address—Dr. George D. Porter, President Canadian Public Health Association.

"New Viewpoints in Regard to Ventilation"—Dr. C.-E. A. Winslow, Yale University, President American Public Health Association.

"Health Teaching in Rural Schools"—Miss Jean Browne, President Canadian Nurses Association.

Paper—Dr. J. W. S. McCullough, Chief Officer of Health, Ontario.

Wednesday, May 5th, 7 p.m.—Complimentary Dinner by Department of Health, Ontario, Hart House, University of Toronto.

Speakers—Hon. Dr. Forbes Godfrey, Minister of Health, Ontario; Dr. C. J. C. O. Hastings, Medical Officer of Health, Toronto.

THIRD SESSION

Ontario Health Officers' Association

Thursday, May 6th, 9.30 a.m.—Room 43.

Chairman—Dr. Fred Adams, Medical Officer of Health, Windsor.

SYMPOSIUM ON IMMUNIZATION—

(a) Diphtheria—Dr. J. G. FitzGerald, University of Toronto; Dr. Ruggles George, Canadian Red Cross Society; Dr. C. D. Farquarson, Medical Officer of Health, Scarboro Township.

(b) Scarlet Fever—Dr. D. T. Fraser, University of Toronto; Dr. Beverley, Hannah, Hospital for Sick Children, Toronto.

(c) Small-pox—Dr. R. D. Defries, University of Toronto.

FOURTH SESSION

General Meeting of the Associations

Thursday, May 6th, 2.15 p.m.—Room 43.

Presidential Address—Dr. F. Adams, President Ontario Health Officers' Association.

"The Medical Aspect of Immigration"—Dr. D. A. Clark, Asst. Deputy Minister of Health, Ottawa.

"What is New in Tuberculosis"—Dr. R. E. Wodehouse, Secretary Canadian Tuberculosis Association.

"Venereal Disease Control in the Province of Quebec"—Dr. A. H. Desloges Director of Division of Venereal Diseases, Prov. Bureau of Health, Quebec.

Paper—Dr. M. M. Seymour, Deputy Minister of Health, Saskatchewan.

FIFTH SESSION

Joint Meeting with the Academy of Medicine (for physicians)

Thursday, May 6th, 8.30 p.m.—Osler Hall, Academy of Medicine.
Chairman—Dr. F. A. Cleland, President Academy of Medicine, Toronto.

"Periodic Health Examinations"—Dr. Haven Emerson, Columbia University, New York; Dr. A. Grant Fleming, Montreal, Anti-Tuberculosis and General Health League

Discussion of the Technique of Examination—Dr. Geo. S. Young; Dr. G. W. Ross; Dr. H. B. Anderson.

Public Health Nursing Section

Thursday, May 6th, 8 p.m.—Room 43.

Chairman—Florence H. M. Emory, Reg. N., Assistant Director, Department of Public Health Nursing, University of Toronto.

"THE RELATIVE VALUE OF HEALTH TRAINING IN THE SCHOOL AND THE HOME"—

"The School"—Bernice Lousley, Reg. N., Swansea, Ont.

"The Home"—Alice Thomson, Reg. N., Toronto.

Discussion led by—B. A. Ross, Reg. N., Toronto and M. L. Moag, Reg. N., Montreal.

"PUBLIC HEALTH IN THE CURRICULUM OF NURSING SCHOOLS"—

"Dalhousie Health Centre"—Esther Beith, Reg. N., Montreal.

"Public Health Teaching for the Undergraduate Nurse"—E. K. Russell, Reg. N., Toronto.

Discussion led by—Edith B. Hurley, Reg. N., Montreal and Miss E. H. Dyke, Toronto.

Election of Officers.

SIXTH SESSION

Ontario Health Officers' Association

Friday, May 7th, 9.00 a.m.—Room 43.

Chairman—Dr. Fred Adams, President Ontario Health Officers' Association.

"Sanitary Inspection of Schools"—Dr. G. A. Morgan, Peterborough.

"The Prevention and Treatment of Dental Disease"—Dr. Wallace Seccombe, Dean of the Faculty of Dentistry, University of Toronto.

"Surgical Removal of Dental Infection"—Dr. W. B. Amy, Toronto.

"The Simplified Feeding of the Normal Infant"—Dr. Frederick Tisdall, Hospital for Sick Children, Toronto.

Report of Standing Committees.

Laboratory Section

Friday, May 7th, 9.30 a.m.—Room 18.

Chairman—Dr. Norman MacLeod Harris.

(1) "Non-Typical Wassermanns in Spinal Fluids"—by Mabel M. Malcolm, Vancouver General Hospital, Vancouver.

(2) "A Sterilizable Dialyzing Membrane—Cellophane"—by Dr. Hibbert W. Hill, Vancouver General Hospital, Vancouver.

(3) "The Effect of Radium Emanations upon Bacillus Tuberculosis"—by Dr. Louis Parè, Notre Dame Hospital, Montreal.

(4) "Further Observations on the Growth of Bacillus Tuberculosis on Plain Agar—by Dr. Louis Parè, Notre Dame Hospital, Montreal.

(5) "Laboratory Diagnosis of Smallpox"—Dr. N. E. McKinnon, Connaught Laboratories, University of Toronto.

Election of Officers.

SEVENTH SESSION

General Meeting of the Associations

Friday, May 7th, 2.15 p.m.—Room 43.

Presidential Address—Hon. Mr. Justice Riddell, President Canadian Social Hygiene Council.

Address—Dr. George E. Vincent, President The Rockefeller Foundation.

Friday, May 7th, 5.00 p.m.—Room 43.

Annual Meeting of Canadian Public Health Association.

EIGHTH SESSION

Friday, May 7th, 8.15 p.m., Hygeia House, 40 Elm St.

Annual Meeting of Canadian Social Hygiene Council.

PROGRAMME OF CLINICS, DEMONSTRATIONS AND VISITS

Register at the Information Desk, Physics Bldg., and cards will be given to you for clinics selected. These cards will furnish complete details of time and place, etc.

Advance notification by those wishing to take part in the field work will greatly facilitate the arrangements. Address communications to Dr. J. T. Phair, Secretary, Spadina House, Toronto.

Ante-Natal Clinics,	Tuesday, 2.15 p.m.
Child Hygiene Clinics,	Monday, 2.15 p.m., Well Baby. Tuesday, 2.15 p.m., Pre-School Children.
Milk Control, and Food Control,	Monday, 2.00 p.m. Tuesday, 2.00 p.m. Saturday, 9.00 a.m.
Visit to Toronto Island,	Tuesday, 9.00 a.m., Inspection of Slow Sand and Drifting Sand Filters.
Visit to Sewage Disposal Plants,	Morley Ave. and Leaside arranged if requested.
Visit to Preventorium	Tuesday, 9.00 a.m.
Visit to Connaught Laboratories, Farm, Downsview	Tuesday, 9.00 a.m.
Nutrition Clinic	Saturday, 9.00 a.m.
Public Health Nursing	Tuesday, 9.00 a.m. Saturday, 9.00 a.m.
School Hygiene—including School Medical Inspection **School Dental Service** **Auxiliary Classes** (Open air, sight saving, lip reading, etc.)	Tuesday, 9.30-12 a.m., 1.30-3.30 p.m.
Hygeia House,	Special Social Hygiene exhibit and demonstration, public health publicity methods

Editorial

THE HEALTH CONGRESS

Elsewhere in this issue of the JOURNAL is the tentative programme for the Health Congress to be held in Toronto in May. This will be an important occasion. Leaders in all fields of health will be present and unexampled opportunities will be available to the members of the three associations meeting in annual session. It is hoped that all readers of the JOURNAL will make it a point to spend the entire week of May 3rd in Toronto.

EUGENICS AND EUTHENICS

Two terms to which a great deal of attention has been paid of recent years are Eugenics and Euthenics. Eugenics, the science of race improvement, bases its appeal on the great influence which heredity has on the health and mentality of human beings. Euthenics, on the other hand, has to do with the influence of environment. Resultant arguments as to the relative value of heredity and environment are, of course, interminable.

It would appear that in spite of the importance of all the things that have been said by the followers of Sir Francis Galton, the exponents of the 'euthenics' idea of the greater value of environment as a factor in the influencing of human destiny have the better of the argument.

Notwithstanding much talk about the fruit of the family tree, feeble-mindedness, sterilization of the unfit and restrictive marriage laws, very little has been accomplished in the development of eugenic methods. On the other hand, practically all of the wonderful advances made in preventive medicine and hygiene have been made by euthenic methods. One authority states that out of one hundred English alive at ten years of age thirty-nine survive to be sixty-eight; out of one hundred Roman Egyptians not nine survived. All of this has been accomplished by environmental improvement.

Pessimistic and woebegone proponents of the idea that feeble-mindedness can be diagnosed by a mental yardstick, that it is increasing and that its hereditary character is definite and proven, have been prone to base most of their conclusions on their prejudices and in all of their investigations to neglect the great influence of education and environ-

ment in early life. It is true that somewhat modified views have been expressed in recent years by some investigators, but the enthusiastic eugenist has done considerable harm by capturing the public imagination to such an extent that the tendency has been to attempt eugenic cures when euthenic prevention should be undertaken.

Eugenics doubtless has its place in a well-ordered community, but it behooves most of us to pay greater attention to the developments of the mind and bodies of our own generation rather than develop excessive zealousness for the welfare of generations yet unborn at the expense of our own.

SOCIAL HYGIENE

A discussion of Eugenics and Euthenics naturally leads one to the consideration of social hygiene. The greatest authorities are agreed that social hygiene includes both Eugenics and Euthenics, although the tendency in Anglo-Saxon countries has been to confine the activities of Social Hygiene organizations to the restricted fields of sex education and venereal disease control.

Havelock Ellis, author of the "Task of Social Hygiene", published nearly twenty years ago, described Social Hygiene in very general terms. appearing to feel that it is simply a late development of public health—an acceptation of the fact that the social factors—the slum, poor wages. the lack of social legislation and inadequate education play a definite part in the production of disease, racial degeneration, and death, just as truly as excessive mortality has its influence on social conditions. A perusal of his work on the subject makes it clear that social reorganization must be of a most extensive character if we are ever to develop the socially hygienic state—a community in which health, long life and happiness are the natural lot of all citizens.

Study of the subject will prove to one that if communities would only decide to take stock of themselves and definitely organize for health, social, physical, moral and mental, many years could be added to human life, and what is perhaps even more important, the world could be made a place worth living in—a place in which happiness and efficiency for the average person could be taken for granted. Obviously such a utopia has not yet been obtained, and disease, divorce, slums, poverty, crime and premature death are still indicative of our shortcomings when it comes to the business of looking after the welfare of the human race.

Social Hygiene as a movement ideally should take cognizance of these matters. As a matter of fact, nowhere as a movement has it lived up to this idea. In Continental Europe it is true that the subject is understood to include more than in America but—even there as a movement it has not become popular or effective as a general movement.

In the United States the restriction of Social Hygiene to a somewhat limited field has been largely a matter of expediency. Apparently the choice of a suitable name to cover the activities of certain organizations desiring to undertake work which, if successful, would mean a great forward step in the field of Social Hygiene, led to the adoption of the name by the national organization in the United States.

In Canada the Social Hygiene Council was given the duty of attacking the problem of venereal disease control. The programme of this organization has broadened from year to year, very largely because it has seemed to be impossible to achieve the original aims of the Council without going far afield and undertaking the promotion of many activities which have to do with the prevention of sexual irregularity. Such activities are of a socially constructive character and achieve much more than the prevention of venereal disease. For example, periodic health examination, a procedure the value of which is certainly obvious to the investigator in the field of syphilis, will not only tend to prevent this development of this disease, but that of all other preventable diseases as well. Pre-natal clinics will prevent not only syphilis, but maternal and infantile mortality in general. Adequate marriage laws and instruction in parenthood not only prevent Venereal Diseases but cut down the divorce rate. It is equally obvious, however, that any fall in the general death-rate will tend to stabilize social conditions, and stable social conditions with improving educational and social opportunities tend to prevent Venereal Diseases.

The tendency in Canada then is for Social Hygiene more or less to merge with or support general health activities, rather than to specialize. If the movement results in waking the public conscience to the necessity for placing health in the forefront as the ideal to be attained by all communities, its purpose will have been more than accomplished.